



IMPACT OF “BUY AMERICA” AND OTHER RESTRICTIVE PROCUREMENT PROVISIONS OF H.R. 1588 ON SEMICONDUCTOR USAGE

The House of Representatives recently passed the FY 2004 National Defense Authorization Act (H.R. 1588) that includes several provisions that change acquisition policy, including “Buy America” requirements. The Government Electronics and Information Technology Association and the JEDEC Solid State Technology Association believe that these provisions have serious implications for electronics manufacturers and threaten DoD’s ability to support electronic weapon systems currently in inventory and furthermore, will prevent future electronic weapon system procurements without exorbitant cost to the U.S. taxpayer.

BACKGROUND

Semiconductors, sometimes referred to as computer chips or integrated circuits, contain numerous electrical pathways which connect thousands or even millions of transistors and other electronic components. The first semiconductors were developed over forty years ago with research funding support from DoD. The first production order for integrated circuits was for the Minuteman Missile program (circa 1959). In 1965, over two thirds of the devices made by the semiconductor industry were used in DoD weapon systems. Integrated circuits were expensive during these early years of semiconductor production and, therefore, were not used as frequently in consumer, industrial, automotive, or communications products as they are today.

Since 1965, process refinements and improvement in manufacturing controls resulted in reduced prices for semiconductor products; larger wafers and higher yields led to an increasing variety of device functions. In addition to defense electronics, many other industries found that semiconductor technology enabled them to offer products that were more reliable and consumed less power. Semiconductor technology created new market opportunities and new applications within existing markets. New industries appeared, such as personal computers, mobile telephones and digital photography. DoD and the defense industry can now choose from a broad array of semiconductor products that do not depend on DoD financial support to develop. DoD, however, no longer commands sufficient market leverage to influence the semiconductor industry. By 1970, DoD consumed well under 50% of the total integrated circuit production. Prior to the collapse of the Soviet bloc, DoD consumption dropped to less than 5%. In 2000, total government consumption (including DoD) fell below 0.5%.

THE U.S. SEMICONDUCTOR INDUSTRY TODAY

Today’s principal complex semiconductor products, including memories, microprocessors, digital signal processors, application-specific logic, are manufactured worldwide. Semiconductor wafer processing takes place in manufacturing facilities that require capital investment in plant and equipment of \$500M to \$1B each. Large plants cost over \$1 billion and a single piece of equipment can cost \$3 million. They are the most costly manufacturing plants found in industry today.



Many technologies have developed since World War II to create the revolution in precision-guided weaponry that enhances the effectiveness of U.S. air, sea and ground warfare forces. These technologies include sensors, guidance, and control for the weapons themselves; advanced sensors and position location systems and platforms, including space systems, to find, identify, and precisely specify targets and their location; improvements in battle damage assessment capability; and advanced computing, communication, command, and control systems to better plan and prosecute attacks against targets.

Initial experience in Desert Storm and subsequently, Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom has shown that using “smart” weapon systems in regional conflicts can help end them decisively and in less time than before these systems were available to U.S. forces. Extensive use of smart weapon systems is key to reducing the length of military campaigns, reducing casualties and equipment losses, saving logistic support required for operating the forces over the shorter time, and reducing fuel and ammunition storage. The components that make these systems smart are semiconductor devices. Without access to semiconductors produced in foreign countries, DoD will not be able to take advantage of technologies that are critical to smart weapon systems such as those used today in the war against terrorism. The legislation proposed in H.R. 1588 would severely limit DoD from purchasing equipment containing the most up-to-date components because they are not manufactured in the United States. In addition to restricting the use of components manufactured by foreign companies, this ban would also restrict the use of components produced by those U.S.-based companies with manufacturing facilities in foreign countries, including several DoD certified facilities. Given the global nature of the semiconductor industry, H.R. 1588 threatens DoD’s ability to support all electronic weapon systems in use today and will prevent all future electronic weapon system acquisitions without exorbitant cost to the taxpayer.

As noted above, DoD and the defense industry no longer command sufficient market leverage to influence the semiconductor industry, including business decisions regarding the location of manufacturing facilities. Legislation restricting the use of components that are not manufactured in the U.S. will exacerbate the existing Diminishing Manufacturing Sources problem experienced by DoD and the defense electronics industry. The cost for establishing a semiconductor fabrication facility has risen from \$14 million in 1966, to \$1.0 billion in 1995, to \$2.7 billion in 1997. The costs are doubling every 4.5 years. Since 1980, semiconductor companies have increasingly relied on collaborative strategies. This collaboration, both domestic and international, is due to the higher costs and risks of new product development and the spiraling costs of new production capacity. Many semiconductor companies found it impossible to invest in new products or manufacturing capacity without some arrangements for risk-sharing. Given these high costs and the small military market for semiconductors, U.S.-based manufacturers with facilities in foreign countries will likely exit the military market rather than establish on-shore facilities. By further limiting the use of components manufactured by foreign companies, the legislation proposed in H.R. 1588 will likely undermine a number of U.S. contracts for military systems with foreign countries and give rise to “Fortress Europe” efforts.



The impact of the legislation proposed in H. R. 1588 extends well beyond just the “integrated chip.” In recent correspondence to the Defense Logistics Agency, the Defense Supply Center Columbus reported that ...

“Currently, virtually all electronic components that the Defense Logistics Agency procures are either fully or partially manufactured offshore or, at a minimum, have materials provided by offshore suppliers. If DoD does not buy from offshore manufacturers, the Military Services will not be able to procure the components for weapon platforms within the timeframes required to retain the necessary level of military readiness. This is particularly critical given the increased emphasis on maintaining and developing weapons systems as a result of the war on terrorism.”

During the 1996 NATO Workshop on Political-Military Decision-making, Undersecretary of Defense Paul Kaminski discussed DoD’s dual-use strategy to break down the barriers between the commercial and defense industries. DoD expects to realize the benefits of commercial-military integration in both research and development and in manufacturing, to increase the pace of innovation in defense systems, and to reduce the cost of such systems. These acquisition reforms have also increased the opportunity for international armaments cooperation.

“I believe that national security -- ours and that of our friends and allies -- now and in the future will increasingly rely on getting the most for our defense investments, and this means more bi- and multilateral armaments cooperation. The underpinning will be a shift towards giving greater importance to the economic and industrial considerations of material acquisition programs in the future. ... we will have to leverage the technology and industrial base of all our nations to modernize the equipment of our defense forces at an affordable cost and in the end obtain best value for the money... We need to avoid the inclination to duplicate each other's capabilities. Instead, we need to think in terms of building on developed capability where possible. To do this, we need to better harmonize requirements from the start and increase the incentives for teaming of our industry -including removing the barriers to international teaming and barriers to commercial industry as well.”

The legislation proposed in H.R.1588 will introduce a new barrier to international teaming in support of armaments cooperation with our allies. In addition, due to the imposition of a number of reporting requirements that had been eliminated during the acquisition reform of the 1990’s, commercial firms doing business with DoD will be forced to withdraw from being suppliers to the military, or undertake massive restructuring at huge expense to comply with these new reporting requirements. Results such as these are just some of the unintended consequences that the provisions of Subtitle B of Title VIII of H.R. 1588 will have on the ability of DoD to provide the U.S. warfighter with the most capable military systems.

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